

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on July 13, 1999.



RECEIVED  
JUL 22 1999  
TECH CENTER 1600/2900

Gr 1641  
Box 50  
W/D

By

*Norman D. Hanson*

LUD 5538.1 CIP - JEL/NDH (987339)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant(s) : CHEN et al.

Serial No. : 09/270,437

Filing Date : March 16, 1999

For : ISOLATED NUCLEIC ACID MOLECULE ENCODING CANCER ASSOCIATED ANTIGENS, THE ANTIGENS PER SE, AND USES THEREOF

Art Unit : 1641

Examiner : Unknown

RECEIVED

JUL 21 1998

TECH CENTER 1600/2900

# 412/Amk/B  
AL  
08/06/99

Hon. Commissioner of Patents  
and Trademarks  
Washington, D.C. 20231

July 13, 1999

**LETTER**

S I R:

Transmitted herewith are paper copy and CRF of sequence information for the above referenced case. It is requested that the paper copy be placed after page 21 and prior to page 22 of the subject application, and that the paper copy of sequence information that currently follows the abstract be CANCELLED.

The undersigned hereby declares that to the best of his knowledge, the accompanying paper copy and CRF of sequence information are identical to each other and to the sequence information as filed originally in this application. No new matter is believed to be included

Respectfully submitted,

**FULBRIGHT & JAWORSKI L.L.P.**

By

*Norman D. Hanson*

Norman D. Hanson  
Reg. No. 30,946

666 Fifth Avenue  
New York, New York 10103  
(212) 318-3000

B'  
CONT'D



<110> Chen, Yao-Tseng  
Gure, Ali  
Tsang, Solam  
Stockert, Elisabeth  
Jager, Elke  
Knuth, Alexander  
Old, Lloyd J.

<120> Isolated Nucleic Acid Molecules Encoding Cancer Associated Antigen, The  
Antigens Per Se, And Uses Thereof

<130> LUD 5538.1 PCT

<140> PCT/US 99/05766

<141> 1998 - 04 - 17

<160> 3

<210> 1

<211> 4265

<212> DNA

<213> Homo sapiens

<220>

<400> 1

Pub  
2

|            |             |            |            |             |            |      |
|------------|-------------|------------|------------|-------------|------------|------|
| GTCTGAAGGA | CCTGAGGCAT  | TTTGTGACGA | GGATCGTCTC | AGGTCAGCGG  | AGGGAGGAGA | 60   |
| CTTATAGACC | TATCCAGTCT  | TCAAGGTGCT | CCAGAAAGCA | GGAGTTGAAG  | ACCTGGGTGT | 120  |
| GAGGGACACA | TACATCCTAA  | AAGCACCACA | GCAGAGGAGG | CCCAGGCAGT  | GCCAGGAGTC | 180  |
| AAGGTTCCCA | GAAGACAAAC  | CCCCTAGGAA | GACAGGCGAC | CTGTGAGGCC  | CTAGAGCACC | 240  |
| ACCTTAAGAG | AAGAAGAGCT  | GTAAGCCGGC | CTTTGTGAGA | GCCATCATGG  | GGGACAAGGA | 300  |
| TATGCCTACT | GCTGGGATGC  | CGAGTCTTCT | CCAGAGTTCC | TCTGAGAGTC  | CTCAGAGTTG | 360  |
| TCCTGAGGGG | GAGGACTCCC  | AGTCTCCTCT | CCAGATTCCC | CAGAGTTCTC  | CTGAGAGCGA | 420  |
| CGACACCCTG | TATCCTCTCC  | AGAGTCCTCA | GAGTCGTTCT | GAGGGGGAGG  | ACTCCTCGGA | 480  |
| TCCTCTCCAG | AGACCTCCTG  | AGGGGAAGGA | CTCCCAGTCT | CCTCTCCAGA  | TTCCCCAGAG | 540  |
| TTCTCCTGAG | GGCGACGACA  | CCCAGTCTCC | TCTCCAGAAT | TCTCAGAGTT  | CTCCTGAGGG | 600  |
| GAAGGACTCC | CTGTCTCCTC  | TAGAGATTTC | TCAGAGCCCT | CCTGAGGGTG  | AGGATGTCCA | 660  |
| GTCTCCTCTG | CAGAATCCTG  | CGAGTTCCTT | CTTCTCCTCT | GCTTTATTGA  | GTATTTTCCA | 720  |
| GAGTCCCCCT | GAGAGTATTC  | AAAGTCCTTT | TGAGGGTTTT | CECCAGTCTG  | TTCTCCAGAT | 780  |
| TCCTGTGAGC | GCCGCTCCT   | CCTCCACTTT | AGTGAGTATT | TTCCAGAGTT  | CCCCTGAGAG | 840  |
| TACTCAAAGT | CCTTTTGAGG  | GTTTTCCCCA | GTCTCCACTC | CAGATTCCCTG | TGAGCCGCTC | 900  |
| CTTCTCCTCC | ACTTTATTGA  | GTATTTTCCA | GAGTTCCCCT | GAGAGAAGTC  | AGAGAACTTC | 960  |
| TGAGGGTTTT | GCACAGTCTC  | CTCTCCAGAT | TCCTGTGAGC | TCCTCCTCGT  | CCTCCACTTT | 1020 |
| ACTGAGTCTT | TTCCAGAGTT  | CCCCTGAGAG | AACTCAGAGT | ACTTTTGAGG  | GTTTTCCCCA | 1080 |
| GTCTCCACTC | CAGATTCCCTG | TGAGCCGCTC | CTTCTCCTCC | ACTTTATTGA  | GTATTTTCCA | 1140 |
| GAGTCCCCCT | GAGAGAACTC  | AGAGTACTTT | TGAGGGTTTT | GCCCAGTCTC  | CTCTCCAGAT | 1200 |
| TCCTGTGAGC | CCCTCCTTCT  | CCTCCACTTT | AGTGAGTATT | TTCCAGAGTT  | CCCCTGAGAG | 1260 |
| AACTCAGAGT | ACTTTTGAGG  | GTTTTCCCCA | GTCTCCTCTC | CAGATTCCTG  | TGAGCTCCTC | 1320 |
| CTTCTCCTCC | ACTTTATTGA  | GTCTTTTCCA | GAGTTCCCCT | GAGAGAACTC  | AGAGTACTTT | 1380 |
| TGAGGGTTTT | CCCCAGTCTC  | CTCTCCAGAT | TCCTGGAAGC | CCCTCCTTCT  | CCTCCACTTT | 1440 |
| ACTGAGTCTT | TTCCAGAGTT  | CCCCTGAGAG | AACTCAGAGT | ACTTTTGAGG  | GTTTTCCCCA | 1500 |
| GTCTCCTCTC | CAGATTCCCTA | TGACCTCCTC | CTTCTCCTCT | ACTTTATTGA  | GTATTTTACA | 1560 |
| GAGTTCCTCT | GAGAGTGCTC  | AAAGTGCTTT | TGAGGGTTTT | CCCCAGTCTC  | CTCTCCAGAT | 1620 |
| TCCTGTGAGC | TCCTCTTTCT  | CCTACACTTT | ATTGAGTCTT | TTCCAGAGTT  | CCCCTGAGAG | 1680 |
| AACTCACAGT | ACTTTTGAGG  | GTTTTCCCCA | GTCTCCTCTC | CAGATTCCTG  | TGAGCTCCTC | 1740 |
| CTCCTCCTCC | TCCACTTTAT  | TGAGTCTTTT | CCAGAGTTCC | CCTGAGTGTG  | CTCAAAGTAC | 1800 |
| TTTTGAGGGT | TTTCCCCAGT  | CTCCTCTCCA | GATTCCTCAG | AGTCCTCCTG  | AAGGGGAGAA | 1860 |
| TACCCATTCT | CCTCTCCAGA  | TTGTTCCAAG | TCTTCCTGAG | TGGGAGGACT  | CCCTGTCTCC | 1920 |
| TCACTACTTT | CCTCAGAGCC  | CTCCTCAGGG | GGAGGACTCC | CTATCTCCTC  | ACTACTTTCC | 1980 |

TCAGAGCCCT CCTCAGGGGG AGGACTCCCT GTCTCCTCAC TACTTTCCTC AGAGCCCTCA 2040  
 GGGGGAGGAC TCCCTGTCTC CTCCTACTTT TCCTCAGAGC CCTCCTCAGG GGGAGGACTC 2100  
 CATGTCTCCT CTCTACTTTC CTCAGAGTCC TCTTCAGGGG GAGGAATTCC AGTCTTCTCT 2160  
 CCAGAGCCCT GTGAGCATCT GCTCCTCCTC CACTCCATCC AGTCTTCCCC AGAGTTTCCC 2220  
 TGAGAGTCT CAGAGTCCTC CTGAGGGGCC TGTCCAGTCT CCTCTCCATA GTCCTCAGAG 2280  
 CCTCCTGAG GGGATGCACT CCCAATCTCC TCTCCAGAGT CCTGAGAGTG CTCCTGAGGG 2340  
 GGAGGATTCC CTGTCTCCTC TCCAAATTCC TCAGAGTCCT CTTGAGGGAG AGGACTCCCT 2400  
 GTCTTCTCTC CATTTTCTCTC AGAGTCCTCC TGAGTGGGAG GACTCCCTCT CTCCTCTCCA 2460  
 CTTTCTCAG TTTCTCCTC AGGGGGAGGA CTTCCAGTCT TCTCTCCAGA GTCCTGTGAG 2520  
 TATCTGCTCC TCTTCCACTT CTTTGAGTCT TCCCCAGAGT TTTCCCTGAGA GTCCTCAGAG 2580  
 TCCTCCTGAG GGGCTGCTC AGTCTCCTCT CCAGAGACCT GTCAGCTCCT TCTTCTCCTA 2640  
 CACTTTAGCG AGTCTTCTCC AAAGTTCCCA TGAGAGTCCT CAGAGTCCTC CTGAGGGGCC 2700  
 TGCCCAGTCT CCTCTCCAGA GTCCTGTGAG CTCCTTCCCC TCCTCCACTT CATCGAGTCT 2760  
 TTCCCAGAGT TCTCCTGTGA GTCCTTCCC CTCCTCCACT TCATCGAGTC TTTCCAAGAG 2820  
 TTCCCCTGAG AGTCCTCTCC AGAGTCCTGT GATCTCCTTC TCCTCCTCCA CTTCAATTGAG 2880  
 CCCATTCACT GATGAGTCCA GCAGCCAGT AGATGAATAT ACAAGTTCTT CAGACACCTT 2940  
 GCTAGAGAGT GATTCCTTGA CAGACAGCGA GTCCCTTGATA GAGAGCGAGC CTTGTTCAGT 3000  
 TTATACACTG GATGAAAAGG TGGACGAGTT GGCAGCGTTT CTTCTCCTCA AATATCAAGT 3060  
 GAAGCAGCCT ATCACAAAGG CAGAGATGCT GACGAATGTC ATCAGCAGGT ACACGGGCTA 3120  
 CTTTCTGTG ATCTTCAGGA AAGCCCGTGA GTTCATAGAG ATACTTTTTG GCATTTCCCT 3180  
 GAGAGAAGTG GACCCTGATG ACTCTATGT CTTTGTAAC ACATTAGACC TCACCTCTGA 3240  
 GGGGTGTCTG AGTGATGAGC AGGGGATGTC CCAGAACCGC CTCCTGATTC TTATTCTGAG 3300  
 TATCATCTTC ATAAAGGGCA CCTATGCTC TGAGGAGGTC ATCTGGGATG TGCTGAGTGG 3360  
 AATAGGGGTG CGTGCTGGGA GGGAGCACTT TGCCTTTGGG GAGCCCAGGG AGCTCCTCAC 3420  
 TAAAGTTTGG GTGCAGGAAC ATTACCTAGA GTACCGGGAG GTGCCCAACT CTTCTCCTCC 3480  
 TCGTTACGAA TTCCTGTGGG GTCCAAGAGC TCATTACAGAA GTCATTAGA GGAAAGTAGT 3540  
 AGAGTTTTTG GCCATGCTAA AGAATACCGT CCCTATTACC TTTCCATCCT CTTACAAGGA 3600  
 TGCTTTGAAA GATGTGGAAG AGAGAGCCCA GGCCATAATT GACACCACAG ATGATTGAC 3660  
 TGCCACAGAA AGTGCAAGCT CCAGTGTCAT GTCCCCCAGC TTCTCTTCTG AGTGAAGTCT 3720  
 AGGGCAGATT CTTCCCTCTG AGTTTGAAG GGGCAGTCGA GTTCTACGT GGTGGAGGGC 3780  
 CTGGTTGAGG CTGGAGAGAA CACAGTGCTA TTTGCATTTT TGTTCCATAT GGGTAGTTAT 3840  
 GGGGTTTACC TGTTTTACTT TTGGGTATTT TTCAAATGCT TTTCTATTA ATAACAGGTT 3900  
 TAAATAGCTT CAGAATCCTA GTTTATGCAC ATGAGTCGCA CATGTATTGC TGTTTTTCTG 3960  
 GTTTAAGAGT AACAGTTTGA TATTTGTAA AAACAAAAC ACACCAAAC ACACCACATT 4020  
 GGGAAAACCT TCTGCCTCAT TTTGTGATGT GTCACAGGTT AATGTGGTGT TACTGTAGGA 4080  
 ATTTTCTTGA AACTGTGAAG GAACTCTGCA GTTAAATAGT GGAATAAAGT AAAGGATTGT 4140  
 TAATGTTTGC ATTTCTCAG GTCCTTGTAG CTGTTGTTCT TGAAAATAA AGATACATAC 4200  
 CTGGTTTGCT TGGCTTACGT AAGAAAGTCG AAGAAAGTAA ACTGTAATAA ATAAAAGTGT 4260  
 CAGTG 4265

<210> 2  
 <211> 1142  
 <212> PRT  
 <213> Homo sapiens  
 <220>  
 <400> 2

Met Gly Asp Lys Asp Met Pro Thr Ala Gly Met Pro Ser Leu Leu Gln  
 5 10 15  
 Ser Ser Ser Glu Ser Pro Gln Ser Cys Pro Glu Gly Glu Asp Ser Gln  
 20 25 30  
 Ser Pro Leu Gln Ile Pro Gln Ser Ser Pro Glu Ser Asp Asp Thr Leu  
 35 40 45  
 Tyr Pro Leu Gln Ser Pro Gln Ser Arg Ser Glu Gly Glu Asp Ser Ser  
 50 55 60  
 Asp Pro Leu Gln Arg Pro Pro Glu Gly Lys Asp Ser Gln Ser Pro Leu  
 65 70 75 80  
 Gln Ile Pro Gln Ser Ser Pro Glu Gly Asp Asp Thr Gln Ser Pro Leu  
 85 90 95

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gln | Asn | Ser | Gln | Ser | Ser | Pro | Glu | Gly | Lys | Asp | Ser | Leu | Ser | Pro | Leu |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Glu | Ile | Ser | Gln | Ser | Pro | Pro | Glu | Gly | Glu | Asp | Val | Gln | Ser | Pro | Leu |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Gln | Asn | Pro | Ala | Ser | Ser | Phe | Phe | Ser | Ser | Ala | Leu | Leu | Ser | Ile | Phe |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Gln | Ser | Ser | Pro | Glu | Ser | Ile | Gln | Ser | Pro | Phe | Glu | Gly | Phe | Pro | Gln |
| 145 |     |     |     | 150 |     |     |     |     |     | 155 |     |     |     |     | 160 |
| Ser | Val | Leu | Gln | Ile | Pro | Val | Ser | Ala | Ala | Ser | Ser | Ser | Thr | Leu | Val |
|     |     |     | 165 |     |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Ser | Ile | Phe | Gln | Ser | Ser | Pro | Glu | Ser | Thr | Gln | Ser | Pro | Phe | Glu | Gly |
|     |     | 180 |     |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Phe | Pro | Gln | Ser | Pro | Leu | Gln | Ile | Pro | Val | Ser | Arg | Ser | Phe | Ser | Ser |
|     | 195 |     |     |     |     | 200 |     |     |     |     |     | 205 |     |     |     |
| Thr | Leu | Leu | Ser | Ile | Phe | Gln | Ser | Ser | Pro | Glu | Arg | Ser | Gln | Arg | Thr |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Ser | Glu | Gly | Phe | Ala | Gln | Ser | Pro | Leu | Gln | Ile | Pro | Val | Ser | Ser | Ser |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Ser | Ser | Ser | Thr | Leu | Leu | Ser | Leu | Phe | Gln | Ser | Ser | Pro | Glu | Arg | Thr |
|     |     |     | 245 |     |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Gln | Ser | Thr | Phe | Glu | Gly | Phe | Pro | Gln | Ser | Pro | Leu | Gln | Ile | Pro | Val |
|     |     | 260 |     |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Ser | Arg | Ser | Phe | Ser | Ser | Thr | Leu | Ser | Ile | Phe | Gln | Ser | Ser | Ser | Pro |
|     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |     |
| Glu | Arg | Thr | Gln | Ser | Thr | Phe | Glu | Gly | Phe | Ala | Gln | Ser | Pro | Leu | Gln |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |
| Ile | Pro | Val | Ser | Pro | Ser | Phe | Ser | Ser | Thr | Leu | Val | Ser | Ile | Phe | Gln |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |
| Ser | Ser | Pro | Glu | Arg | Thr | Gln | Ser | Thr | Phe | Glu | Gly | Phe | Pro | Gln | Ser |
|     |     |     | 325 |     |     |     |     |     | 330 |     |     |     |     | 335 |     |
| Pro | Leu | Gln | Ile | Pro | Val | Ser | Ser | Ser | Phe | Ser | Ser | Thr | Leu | Leu | Ser |
|     |     | 340 |     |     |     |     |     | 345 |     |     |     |     | 350 |     |     |
| Leu | Phe | Gln | Ser | Ser | Pro | Glu | Arg | Thr | Gln | Ser | Thr | Phe | Glu | Gly | Phe |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |
| Pro | Gln | Ser | Pro | Leu | Gln | Ile | Pro | Gly | Ser | Pro | Ser | Phe | Ser | Ser | Thr |
|     | 370 |     |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |
| Leu | Leu | Ser | Leu | Phe | Gln | Ser | Ser | Pro | Glu | Arg | Thr | His | Ser | Thr | Phe |
| 385 |     |     |     |     | 390 |     |     |     |     | 395 |     |     |     |     | 400 |
| Glu | Gly | Phe | Pro | Gln | Ser | Pro | Leu | Gln | Ile | Pro | Met | Thr | Ser | Ser | Phe |
|     |     |     | 405 |     |     |     |     |     | 410 |     |     |     |     | 415 |     |
| Ser | Ser | Thr | Leu | Ser | Ile | Leu | Gln | Ser | Ser | Pro | Glu | Ser | Ala | Gln |     |
|     |     | 420 |     |     |     |     | 425 |     |     |     |     |     | 430 |     |     |
| Ser | Ala | Phe | Glu | Gly | Phe | Pro | Gln | Ser | Pro | Leu | Gln | Ile | Pro | Val | Ser |
|     |     | 435 |     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |
| Ser | Ser | Phe | Ser | Tyr | Thr | Leu | Leu | Ser | Leu | Phe | Gln | Ser | Ser | Pro | Glu |
|     | 450 |     |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     |
| Arg | Thr | His | Ser | Thr | Phe | Glu | Gly | Phe | Pro | Gln | Ser | Pro | Leu | Gln | Ile |
| 465 |     |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |
| Pro | Val | Ser | Ser | Ser | Ser | Ser | Ser | Ser | Thr | Leu | Leu | Ser | Leu | Phe | Gln |
|     |     |     | 485 |     |     |     |     |     | 490 |     |     |     |     | 495 |     |
| Ser | Ser | Pro | Glu | Cys | Thr | Gln | Ser | Thr | Phe | Glu | Gly | Phe | Pro | Gln | Ser |
|     |     | 500 |     |     |     |     |     | 505 |     |     |     |     | 510 |     |     |
| Pro | Leu | Gln | Ile | Pro | Gln | Ser | Pro | Pro | Glu | Gly | Glu | Asn | Thr | His | Ser |
|     |     | 515 |     |     |     |     | 520 |     |     |     |     | 525 |     |     |     |
| Pro | Leu | Gln | Ile | Val | Pro | Ser | Leu | Pro | Glu | Trp | Glu | Asp | Ser | Leu | Ser |
|     | 530 |     |     |     |     | 535 |     |     |     |     | 540 |     |     |     |     |
| Pro | His | Tyr | Phe | Pro | Gln | Ser | Pro | Pro | Gln | Gly | Glu | Asp | Ser | Leu | Ser |
| 545 |     |     |     |     | 550 |     |     |     |     | 555 |     |     |     |     | 560 |
| Pro | His | Tyr | Phe | Pro | Gln | Ser | Pro | Pro | Gln | Gly | Glu | Asp | Ser | Leu | Ser |
|     |     |     | 565 |     |     |     |     |     | 570 |     |     |     |     |     | 575 |

Prob  
 C2  
 u4

|      |      |     |     |      |      |      |      |     |      |      |     |      |     |      |      |
|------|------|-----|-----|------|------|------|------|-----|------|------|-----|------|-----|------|------|
| Pro  | His  | Tyr | Phe | Pro  | Gln  | Ser  | Pro  | Gln | Gly  | Glu  | Asp | Ser  | Leu | Ser  | Pro  |
|      |      |     | 580 |      |      |      |      | 585 |      |      |     |      | 590 |      |      |
| His  | Tyr  | Phe | Pro | Gln  | Ser  | Pro  | Pro  | Gln | Gly  | Glu  | Asp | Ser  | Met | Ser  | Pro  |
|      |      | 595 |     |      |      |      | 600  |     |      |      |     | 605  |     |      |      |
| Leu  | Tyr  | Phe | Pro | Gln  | Ser  | Pro  | Leu  | Gln | Gly  | Glu  | Glu | Phe  | Gln | Ser  | Ser  |
|      | 610  |     |     |      |      | 615  |      |     |      |      | 620 |      |     |      |      |
| Leu  | Gln  | Ser | Pro | Val  | Ser  | Ile  | Cys  | Ser | Ser  | Ser  | Thr | Pro  | Ser | Ser  | Leu  |
| 625  |      |     |     |      | 630  |      |      |     |      | 635  |     |      |     |      | 640  |
| Pro  | Gln  | Ser | Phe | Pro  | Glu  | Ser  | Ser  | Gln | Ser  | Pro  | Pro | Glu  | Gly | Pro  | Val  |
|      |      |     | 645 |      |      |      |      |     | 650  |      |     |      |     | 655  |      |
| Gln  | Ser  | Pro | Leu | His  | Ser  | Pro  | Gln  | Ser | Pro  | Pro  | Glu | Gly  | Met | His  | Ser  |
|      |      |     | 660 |      |      |      |      | 665 |      |      |     |      | 670 |      |      |
| Gln  | Ser  | Pro | Leu | Gln  | Ser  | Pro  | Glu  | Ser | Ala  | Pro  | Glu | Gly  | Glu | Asp  | Ser  |
|      |      | 675 |     |      |      |      | 680  |     |      |      |     |      | 685 |      |      |
| Leu  | Ser  | Pro | Leu | Gln  | Ile  | Pro  | Gln  | Ser | Pro  | Leu  | Glu | Gly  | Glu | Asp  | Ser  |
|      | 690  |     |     |      |      | 695  |      |     |      |      | 700 |      |     |      |      |
| Leu  | Ser  | Ser | Leu | His  | Phe  | Pro  | Gln  | Ser | Pro  | Pro  | Glu | Trp  | Glu | Asp  | Ser  |
| 705  |      |     |     |      | 710  |      |      |     |      | 715  |     |      |     |      | 720  |
| Leu  | Ser  | Pro | Leu | His  | Phe  | Pro  | Gln  | Phe | Pro  | Pro  | Gln | Gly  | Glu | Asp  | Phe  |
|      |      |     |     | 725  |      |      |      |     | 730  |      |     |      |     | 735  |      |
| Gln  | Ser  | Ser | Leu | Gln  | Ser  | Pro  | Val  | Ser | Ile  | Cys  | Ser | Ser  | Ser | Thr  | Ser  |
|      |      |     | 740 |      |      |      |      | 745 |      |      |     |      |     | 750  |      |
| Leu  | Ser  | Leu | Pro | Gln  | Ser  | Phe  | Pro  | Glu | Ser  | Pro  | Gln | Ser  | Pro | Pro  | Glu  |
|      |      | 755 |     |      |      |      | 760  |     |      |      |     | 765  |     |      |      |
| Gly  | Pro  | Ala | Gln | Ser  | Pro  | Leu  | Gln  | Arg | Pro  | Val  | Ser | Ser  | Phe | Phe  | Ser  |
|      | 770  |     |     |      |      | 775  |      |     |      |      | 780 |      |     |      |      |
| Tyr  | Thr  | Leu | Ala | Ser  | Leu  | Leu  | Gln  | Ser | Ser  | His  | Glu | Ser  | Pro | Gln  | Ser  |
| 785  |      |     |     |      | 790  |      |      |     |      | 795  |     |      |     |      | 800  |
| Pro  | Pro  | Glu | Gly | Pro  | Ala  | Gln  | Ser  | Pro | Leu  | Gln  | Ser | Pro  | Val | Ser  | Ser  |
|      |      |     |     | 805  |      |      |      |     | 810  |      |     |      |     | 815  |      |
| Phe  | Pro  | Ser | Ser | Thr  | Ser  | Ser  | Ser  | Leu | Ser  | Gln  | Ser | Ser  | Pro | Val  | Ser  |
|      |      |     | 820 |      |      |      |      | 825 |      |      |     |      | 830 |      |      |
| Ser  | Phe  | Pro | Ser | Ser  | Thr  | Ser  | Ser  | Ser | Leu  | Ser  | Lys | Ser  | Ser | Pro  | Glu  |
|      |      | 835 |     |      |      |      |      | 840 |      |      |     |      | 845 |      |      |
| Ser  | Pro  | Leu | Gln | Ser  | Pro  | Val  | Ile  | Ser | Phe  | Ser  | Ser | Ser  | Thr | Ser  | Leu  |
|      |      | 850 |     |      |      | 855  |      |     |      |      | 860 |      |     |      |      |
| Ser  | Pro  | Phe | Ser | Glu  | Glu  | Ser  | Ser  | Ser | Pro  | Val  | Asp | Glu  | Tyr | Thr  | Ser  |
| 865  |      |     |     |      | 870  |      |      |     |      | 875  |     |      |     |      | 880  |
| Ser  | Ser  | Asp | Thr | Leu  | Leu  | Glu  | Ser  | Asp | Ser  | Leu  | Thr | Asp  | Ser | Glu  | Ser  |
|      |      |     | 885 |      |      |      |      |     | 890  |      |     |      |     | 895  |      |
| Leu  | Ile  | Glu | Ser | Glu  | Pro  | Leu  | Phe  | Thr | Tyr  | Thr  | Leu | Asp  | Glu | Lys  | Val  |
|      |      |     | 900 |      |      |      |      | 905 |      |      |     |      | 910 |      |      |
| Asp  | Glu  | Leu | Ala | Arg  | Phe  | Leu  | Leu  | Lys | Tyr  | Gln  | Val | Lys  | Gln | Pro  |      |
|      |      | 915 |     |      |      |      |      | 920 |      |      |     | 925  |     |      |      |
| Ile  | Thr  | Lys | Ala | Glu  | Met  | Leu  | Thr  | Asn | Val  | Ile  | Ser | Arg  | Tyr | Thr  | Gly  |
|      | 930  |     |     |      |      | 935  |      |     |      |      | 940 |      |     |      |      |
| Tyr  | Phe  | Pro | Val | Ile  | Phe  | Arg  | Lys  | Ala | Arg  | Glu  | Phe | Ile  | Glu | Ile  | Leu  |
| 945  |      |     |     |      | 950  |      |      |     |      | 955  |     |      |     |      | 960  |
| Phe  | Gly  | Ile | Ser | Leu  | Arg  | Glu  | Val  | Asp | Pro  | Asp  | Asp | Ser  | Tyr | Val  | Phe  |
|      |      |     | 965 |      |      |      |      |     | 970  |      |     |      |     | 975  |      |
| Val  | Asn  | Thr | Leu | Asp  | Leu  | Thr  | Ser  | Glu | Gly  | Cys  | Leu | Ser  | Asp | Glu  | Gln  |
|      |      |     | 980 |      |      |      |      | 985 |      |      |     |      | 990 |      |      |
| Gly  | Met  | Ser | Gln | Asn  | Arg  | Leu  | Leu  | Ile | Leu  | Ile  | Leu | Ser  | Ile | Ile  | Phe  |
|      |      | 995 |     |      |      |      | 1000 |     |      |      |     | 1005 |     |      |      |
| Ile  | Lys  | Gly | Thr | Tyr  | Ala  | Ser  | Glu  | Glu | Val  | Ile  | Trp | Asp  | Val | Leu  | Ser  |
|      | 1010 |     |     |      |      | 1015 |      |     |      |      |     | 1020 |     |      |      |
| Gly  | Ile  | Gly | Val | Arg  | Ala  | Gly  | Arg  | Glu | His  | Phe  | Ala | Phe  | Gly | Glu  | Pro  |
| 1025 |      |     |     |      | 1030 |      |      |     |      | 1035 |     |      |     |      | 1040 |
| Arg  | Glu  | Leu | Leu | Thr  | Lys  | Val  | Trp  | Val | Gln  | Glu  | His | Tyr  | Leu | Glu  | Tyr  |
|      |      |     |     | 1045 |      |      |      |     | 1050 |      |     |      |     | 1055 |      |

Onb  
 C3  
 up

Arg Glu Val Pro Asn Ser Ser Pro Pro Arg Tyr Glu Phe Leu Trp Gly  
 1060 1065 1070  
 Pro Arg Ala His Ser Glu Val Ile Lys Arg Lys Val Val Glu Phe Leu  
 1075 1080 1085  
 Ala Met Leu Lys Asn Thr Val Pro Ile Thr Phe Pro Ser Ser Tyr Lys  
 1090 1095 1100  
 Asp Ala Leu Lys Asp Val Glu Glu Arg Ala Gln Ala Ile Ile Asp Thr  
 1105 1110 1115 1120  
 Thr Asp Asp Ser Thr Ala Thr Glu Ser Ala Ser Ser Ser Val Met Ser  
 1125 1130 1135  
 Pro Ser Phe Ser Ser Glu  
 1140

<210> 3  
 <211> 7  
 <212> PRT  
 <213> Homo sapiens  
 <220>  
 <400> 3

Pro Gln Ser Pro Leu Gln Ile  
 1 5

<210> 4  
 <211> 4159  
 <212> DNA  
 <213> Homo sapiens  
 <220>  
 <400> 4

GGTGGATGCG TTTGGGTTGT AGCTAGGCTT TTTCTTTTCT TTCTCTTTTA AAACACATCT 60  
 AGACAAGGAA AAAACAAGCC TCGGATCTGA TTTTTCACCT CTCGTTCTTG TGCTTGGTTC 120  
 TTACTGTGTT TGTGTATTTT AAAGGCGAGA AGACGAGGGG AACAAAACCA GCTGGATCCA 180  
 TCCATCACCG TGGGTGGTTT TAATTTTTCG TTTTTCCTCG TTATTTTTCG TTAACAAC 240  
 ACTCTTCACA ATGAACAAAC TGTATATCGG AAACCTCAGC GAGAACGCCG CCCCCTCGGA 300  
 CCTAGAAAGT ATCTTCAAGG ACGCCAAGAT CCCGGTGTCT GGACCCTTCC TGGTGAAGAC 360  
 TGGCTACGCG TTCGTGGACT GCCCGGACGA GAGCTGGGCC CTCAAGGCCA TCGAGGCGCT 420  
 TTCAGGTAAT ATAGAAGTGC ACGGGAAACC CATAGAAGTT GAGCACTCGG TCCCAAAAAG 480  
 GCAAAGGATT CGGAAACTTC AGATACGAAA TATCCCGCCT CATTTACAGT GGGAGGTGCT 540  
 GGATAGTTTA CTAGTCCAGT ATGGAGTGGT GGAGAGCTGT GAGCAAGTGA AACTGACTC 600  
 GGAAACTGCA GTTGTAATATG TAACCTATTC CAGTAAGGAC CAAGCTAGAC AAGCACTAGA 660  
 CAAACTGAAT GGATTTTCAGT TAGAGAATTT CACCTTGAAA GTAGCCTATA TCCCTGATGA 720  
 AATGGCCGCC CAGCAAAACC CTTTGCAGCA GCGCCGAGGT CGCCGGGGGG TTGGGCAGAG 780  
 GGGCTCCTCA AGGCAGGGGT CTCCAGGATC CGTATCCAAG CAGAAACCAT GTGATTGACC 840  
 TCTGCGCCTG CTGGTTCCCA CCCAATTTGT TGGAGCCATC ATAGGAAAAG AAGGTGCCAC 900  
 CATTGCGAAC ATCACCAAC AGACCCAGTC TAAATTCGAT GTCCACCGTA AAGAAAATGC 960  
 GGGGCTGCT GAGAAGTCGA TTAATATCCT CTCTACTCCT GAAGGCACCT CTGCGGCTTG 1020  
 TAAGTCTATT CTGGAGATTA TGCATAAGGA AGCTCAAGAT ATAAAATTCA CAGAAGAGAT 1080  
 CCCCTTGAAG ATTTTAGCTC ATAATAACTT TGTTGGACGT CTTATTGGTA AAGAAAGGAG 1140  
 AAATCTTAAA AAAATTGAGC AAGACACAGA CACTAAAATC ACGATATCTC CATTCAGGA 1200  
 ATTGACGCTG TATAATCCAG AACGCACTAT TACAGTTAAA GGCAATGTTG AGACATGTGC 1260  
 CAAAGCTGAG GAGGAGATCA TGAAGAAAAT CAGGGAGTCT TATGAAAATG ATATTGCTTC 1320  
 TATGAATCTT CAAGCACATT TAATTCCTGG ATTAAATCTG AACGCCTTGG GTCTGTGCC 1380  
 ACCCACTTCA GGGATGCCAC CTCCACCTC AGGGCCCCCT TCAGCCATGA CTCTCCCTA 1440  
 CCCGCAGTTT GAGCAATCAG AAACGGAGAC TGTTTCATCAG TTTATCCCAG CTCTATCAGT 1500  
 CGGTGCCATC ATCGGCAAGC AGGGCCAGCA CATCAAGCAG CTTTCTCGCT TTGCTGGAGC 1560  
 TTCAATTAAG ATTGCTCCAG CGGAAGCACC AGATGCTAAA GTGAGGATGG TGATTATCAC 1620

TGGACCACCA GAGGCTCAGT TCAAGGCTCA GGAAGAATT TATGGAAAAA TTAAAGAAGA 1680  
 AACTTTGTT AGTCCTAAAG AAGAGGTGAA ACTTGAAGCT CATATCAGAG TGCCATCCTT 1740  
 TGCTGCTGGC AGAGTTATTG GAAAAGGAGG CAAAACGGTG AATGAAGTTC AGAATTTGTC 1800  
 AAGTSCAGAA GTTGTGTGCC CTCGTGACCA GACACCTGAT GAGAATGACC AAGTGGTTGT 1860  
 CAAAAAAGT GGTCACTTCT ATGCTTGCCA GGTGCCCCAG AGAAAAATTC AGGAAATCT 1920  
 GACTCAGGTA AAGCAGCACC AACACAGAA GGCTCTGCAA AGTGGACCAC CTCAGTCAAG 1980  
 ACGGAAGTAA AGGCTCAGGA AACAGCCCAC CACAGAGGCA GATGCCAAAC CAAAGACAGA 2040  
 TTGCTTAAAC AACAGATGGG CGCTGACCCC CTATCCAGAA TCACATGCAC AAGTTTTTAC 2100  
 CTAGCCAGTT GTTTCTGAGG ACCAGGCAAC TTTTGAAGTC CTGTCTCTGT GAGAATGTAT 2160  
 ACTTTATGCT CTCTGAAATG TATGACACCC AGCTTTAAAA CAAACAAACA AACAAACAAA 2220  
 AAAAGGGTGG GGGAGGGAGG GAAAGAGAAG AGCTCTGCAC TTCCCTTTGT TGTAGTCTCA 2280  
 CAGTATAACA GATATTCTAA TTCTTCTTAA TATCCCCCA TAATGCCAGA AATTGGCTTA 2340  
 ATGATGCTTT CACTAAATTC ATCAAATAGA TTGCTCCTAA ATCCAATTGT TAAATTTGGA 2400  
 TCAGAATAAT TATCACAGGA ACTTAAATGT TAAGCCATTA GCATAGAAAA ACTGTTCTCA 2460  
 GTTTTATTTT TACCTAACAC TAACATGAGT AACCTAAGGG AAGTGCTGAA TGGTGTGGC 2520  
 AGGGGTATTA AACGTGCATT TTTACTCAAC TACCTCAGGT ATTCAGTAAT ACAATGAAA 2580  
 GCAAATTTGT TCCTTTTTTT TGAAAATTTT ATATACTTTA TAATGATAGA AGTCCAACCG 2640  
 TTTTTTAAAA AATAAATTTA AAATTTAACA GCAATCAGCT AACAGGCAAA TTAAGATTTT 2700  
 TACTTCTGGC TGGTGACAGT AAAGCTGGAA AATTAATTTT AGGGTTTTTT GAGGCTTTTG 2760  
 ACACAGTTAT TAGTTAAATC AAATGTTCAA AAATACGGAG CAGTGCCTAG TATCTGGAGA 2820  
 GCAGCACTAC CATTTATTCT TTCAATTTATA GTTGGGAAAG TTTTGGACGG TACTAACAAA 2880  
 GTGGTCGCAG GAGATTTTGG AACGCTGGT TTAATGGCT TCAGGAGACT TCAGTTTTTT 2940  
 GTTTAGCTAC ATGATTGAAT GCATAATAAA TGCTTTGTGC TTCTGACTAT CAATACCTAA 3000  
 AGAAAGTGCA TCAGTGAAGA GATGCAAGC TTTCAACTGA CTGGCAAAAA GCAAGCTTTA 3060  
 GCTTGTCTTA TAGGATGCTT AGTTTGCCAC TACACTTCAG ACCAATGGGA CAGTCATAGA 3120  
 TGGTGTGACA GTGTTTAAAC GCAACAAAAG GCTACATTTT CATGGGGCCA GCACTGTCAT 3180  
 GAGCCTCACT AAGCTATTTT GAAGATTTT AAGCACTGAT AAATTAAAAA AAAAAAAAAA 3240  
 AAATTAGACT CCACCTTAAG TAGTAAAGTA AACAGGATT TCTGTATACT GTGCAATCAG 3300  
 TTCTTTGAAA AAAAAGTCAA AAGATAGAGA ATACAAGAAA AGTTTTNNGG ATATAATTTG 3360  
 AATGACTGTG AAAACATATG ACCTTTGATA ACGAATCAT TTGCTCACTC CTTGACAGCA 3420  
 AAGCCCAGTA CGTACAATTG TGTGGGTGT GGGTGGTCTC CAAGGCCACG CTGCTCTCTG 3480  
 AATTGATTTT TTGAGTTTTG GNTTGNAAAG TGATCACAGN CATGTTACAC TGATCTTNA 3540  
 GGACATATNT TATAACCTT TAAAAAATA ATCCCTGCC TCATTCTTAT TCGAGATGA 3600  
 ATTTGATAC AGACTAGATG TCTTTCTGAA GATCAATTAG ACATTNTGAA AATGATTTAA 3660  
 AGTGTTTTCC TTAATGTTCT CTGAAAACAA GTTTCTTTT TAGTTTTAAC CAAAAAAGTG 3720  
 CCCTTTTTGT CACTGGTTTC TCCTAGCATT CATGATTTTT TTTTCACACA ATGAATTAAA 3780  
 ATTGCTAAAA TCATGGACTG GCTTTCTGGT TGGATTTTCA GTAAGATGTG TTTAAGGCCA 3840  
 GAGCTTTTCT CAGTATTTGA TTTTTTTCCC CAATATTTGA TTTTTTAAAA ATATACACAT 3900  
 AGGAGCTGCA TTTAAACCTT GCTGGTTTAA ATTCTGTGAN ATTTCACTTC TAGCCTTTTA 3960  
 GTATGGCNAA TCANAATTTA CTTTTACTTA AGCATTTGTA ATTTGGAGTA TCTGGTACTA 4020  
 GCTAAGAAAT AATTGNATA TTGAGTTTTG TACTCNCAA ANATGGGTCA TTCCTCATGN 4080  
 ATAATGTNCC CCCAATGCAG CTTCAATTTT CAGANACCTT GACGCAGGAT AAATTTTTTC 4140  
 ATCATTTAGG TCCCCAAA 4159

<210> 5  
 <211> 1708  
 <212> DNA  
 <213> Homo sapiens  
 <220>  
 <400> 5

AGGGACGCTG CCGCACCGCC CCAGTTTACC CCGGGGAGCC ATCATGAAGC TGAATGGCCA 60  
 CCAGTTGGAG AACCATGCCC TGAAGGTCTC CTACATCCCC GATGAGCAGA TAGCACAGGG 120  
 ACCTGAGAAT GGGCGCCGAG GGGGCTTTGG CTCTCGGGGT CAGCCCCGCC AGGGCTCACC 180  
 TGTGGCAGCG GGGGCCCCAG CCAAGCAGCA GCAAGTGGAC ATCCCCCTTC GGCTCCTGGT 240  
 GCCACCCAG TATGTGGGTG CCATTATTGG CAAGGAGGGG GCCACCATCC GCAACATCAC 300  
 AAAACAGACC CAGTCCAAG TAGACGTGCA TAGGAAGGAG AACGCAGGTG CAGCTGAAAA 360  
 AGCCATCAGT GTGCACTCCA CCCCTGAGGG CTGCTCCTCC GCTTGTAAGA TGATCTTGA 420  
 GATTATGCAT AAAGAGGCTA AGGACACCAA AACGGCTGAC GAGGTTCCCC TGAAGATCCT 480

|            |            |            |            |             |             |      |
|------------|------------|------------|------------|-------------|-------------|------|
| GGCCCATAA  | AACTTTGTAG | GGCGTCTCAT | TGGCAAGGAA | GGACGGAACC  | TGAAGAAGGT  | 540  |
| AGAGCAAGAT | ACCGAGACAA | AAATCACCAT | CTCCTCGTTG | CAAGACCTTA  | CCCTTTACAA  | 600  |
| CCCAGAGAGG | ACCATCACTG | TGAAGGGGGC | CATCGAGAAT | TGTTGCAGGG  | CCGAGCAGGA  | 660  |
| AATAATGAAG | AAAGTTCGGG | AGGCCTATGA | GAATGATGTG | GCTGCCATGA  | GCTCTCACCT  | 720  |
| GATCCCTGGC | CTGAACCTGG | CTGCTGTAGG | TCTTTTCCCA | GCTTCATCCA  | GCGCAGTCCC  | 780  |
| GCCGCCTGCC | AGCAGCGTTA | CTGGGGCTGC | TCCCTATAGC | TCCTTTATGC  | AGGCTCCCGA  | 840  |
| GCAGGAGATG | GTGCAGGTGT | TTATCCCCGC | CCAGGCAGTG | GGCGCCATCA  | TCGGCAAGAA  | 900  |
| GGGGCAGCAC | ATCAAACAGC | TCTCCCGGTT | TGCCAGCGCC | TCCATCAAGA  | TTGCACCACC  | 960  |
| CGAAACACCT | GACTCCAAAG | TTCGTATGGT | TATCATCACT | GGACCGCCAG  | AGGCCCAATT  | 1020 |
| CAAGGCTCAG | GGAGAATCT  | ATGGCAAAC  | CAAGGAGGAG | AACTTCTTTG  | GTCCCAAGGA  | 1080 |
| GGAAGTGAAG | CTGGAGACCC | ACATACGTGT | GCCAGCATCA | GCAGCTGGCC  | GGGTCAATTGG | 1140 |
| CAAAGGTGGA | AAAACGGTGA | ACGAGTTGCA | GAATTTGACG | GCAGCTGAGG  | TGGTAGTACC  | 1200 |
| AAGAGACCAG | ACCCCTCATG | AGAACGACCA | GGTCATCGTG | AAAAATCATCG | GACATTTCTA  | 1260 |
| TGCCAGTCAG | ATGGCTCAAC | GGAAGATCCG | AGACATCCTG | GCCCAGGTTA  | AGCAGCAGCA  | 1320 |
| TCAGAAGGGA | CAGAGTAAAC | AGGCCCAGGC | ACGGAGGAAG | TGACCAGCCC  | CTCCCTGTCC  | 1380 |
| CTTNGAGTCC | AGGACAACAA | CGGGCAGAAA | TCGAGAGTGT | GCTCTCCCCG  | GCAGGCCCTGA | 1440 |
| GAATGAGTGG | GAATCCGGGA | GACNTGGGCC | GGGCTGTAGA | TCAGGTTTGC  | CCACTTGATT  | 1500 |
| GAGAAAGATG | TTCCAGTGAG | GAACCCTGAT | CTNTCAGCCC | CAAACACCCA  | CCCAATTGGC  | 1560 |
| CCAACACTGT | NTGCCCTCG  | GGGTGTCAGA | AATTNTAGCG | CAAGGCACTT  | TAAACGTGG   | 1620 |
| ATTGTTTTAA | GAAGCTCTCC | AGGCCCCACC | AAGAGGGTGG | ATCACACCTC  | AGTGGGAAGA  | 1680 |
| AAAATAAAAT | TTCCTTCAGG | TTTTAAAA   |            |             |             | 1708 |

<210> 6  
 <211> 3412  
 <212> DNA  
 <213> Homo sapiens  
 <220>  
 <400> 6

|            |            |            |            |             |             |      |
|------------|------------|------------|------------|-------------|-------------|------|
| GGCAGCGGAG | GAGGCGAGGA | GCGCCGGGTA | CCGGGCGGGG | GGAGCCGCGG  | GCTCTCGGGG  | 60   |
| AAGAGACGGA | TGATGAACAA | GCTTTACATG | GGGAACCTGA | GCCCCGCCGT  | CACCGCCGAC  | 120  |
| GACCTCCGGC | AGCTCTTTGG | GGACAGGAAG | CTGCCCTTGG | CGGGACAGGT  | CCTGCTGAAG  | 180  |
| TCCGGCTACG | CCTTCGTGGA | CTACCCCGAC | CAGAACTGGG | CCATCCGCGC  | CATCGAGAGC  | 240  |
| CTCTCGGGTA | AAGTGAAT   | GCATGGGAAA | ATCATGGAAG | TTGATTACTC  | AGTCTCTAAA  | 300  |
| AAGCTAAGGA | GCAGGAAAAT | TCAGATTCTG | AACATCCCTC | CTCACCTGCA  | GTGGGAGGTG  | 360  |
| TTGGATGGAC | TTTTGGCTCA | ATATGGGACA | GTGGAGAATG | TGGAACAAGT  | CAACACAGAC  | 420  |
| ACAGAAACCG | CCGTTGTCAA | CGTCACATAT | GCAACAAGAG | AAGAAGCAAA  | AATAGCCATG  | 480  |
| GAGAAGCTAA | GCGGGCATCA | GTTTGAGAAC | TACTCCTTCA | AGATTTCTTA  | CATCCCGGAT  | 540  |
| GAAGAGGTGA | GCTCCCCCTC | GCCCCCTCAG | CGAGCCCAGC | GTGGGGACCA  | CTCTTCCCGG  | 600  |
| GAGCAAGGCC | ACGCCCTTGG | GGGCACTTCT | CAGGCCAGAC | AGATTGATTT  | CCCGCTGCGG  | 660  |
| ATCCTGGTCC | CCACCCAGTT | TGTTGGTGCC | ATCATCGGAA | AGGAGGGCTT  | GACCATAAAG  | 720  |
| AACATCACTA | AGCAGACCCA | GTCCCGGGTA | GATATCCATA | GAAAAGAGAA  | CTCTGGAGCT  | 780  |
| GCAGAGAAGC | CTGTCAACAT | CCATGCCACC | CCAGAGGGGA | CTTCTGAAGC  | ATGCCGCATG  | 840  |
| ATTCTTGAAA | TCATGCAGAA | AGAGGCAGAT | GAGACCAAAC | TAGCCGAAGA  | GATTCTCTCTG | 900  |
| AAAATCTTGG | CACACAATGG | CTTGGTTGGA | AGACTGATTG | GAAAAGAAGG  | CAGAAATTTG  | 960  |
| AAGAAAATTG | AACATGAAAC | AGGGACCAAG | ATAACAATCT | CATCTTTGCA  | GGATTTGAGC  | 1020 |
| ATATACAACC | CGGAAAGAAC | CATCACTGTG | AAGGGCACAG | TTGAGGCCCTG | TGCCAGTGCT  | 1080 |
| GAGATAGAGA | TTATGAAGAA | GCTGCGTGAG | GCCTTTGAAA | ATGATATGCT  | GGCTGTTAAC  | 1140 |
| CAACAAGCCA | ATCTGATCCC | AGGGTTGAAC | CTCAGCGCAC | TTGGCATCTT  | TTCAACAGGA  | 1200 |
| CTGTCCGTGC | TATCTCCACC | AGCAGGGCCC | CGCGGAGCTC | CCCCCGCTGC  | CCCCTACCCG  | 1260 |
| CCCTTCACTA | CCCACTCCGG | ATACTTCTCC | AGCCTGTACC | CCCATCACCA  | GTTTGGCCCG  | 1320 |
| TTCCCGCATC | ATCACTCTTA | TCCAGAGCAG | GAGATTGTGA | ATCTCTTCAT  | CCCAACCCAG  | 1380 |
| GCTGTGGGCG | CCATCATCGG | GAAGAAGGGG | GCACACATCA | AACAGCTGGC  | GAGATTCGCC  | 1440 |
| GGAGCCTCTA | TCAAGATTGC | CCCTGCGGAA | GGCCAGACG  | TCAGCGAAAG  | GATGGTCATC  | 1500 |
| ATCACCGGGC | CACCGGAAGC | CCAGTTCAAG | GCCCAGGGAC | GGATCTTTGG  | GAAACTGAAA  | 1560 |
| GAGGAAAAC  | TCTTTAACCC | CAAAGAAGAA | GTGAAGCTGG | AAGCGCATAT  | CAGAGTGCCC  | 1620 |
| TCTTCCACAG | CTGGCCGGGT | GATTGGCAAA | GGTGGCAAGA | CCGTGAACGA  | ACTGCAGAAC  | 1680 |
| TTAACCAGTG | CAGAAGTCAT | CGTGCCTCGT | GACCAAACGC | CAGATGAAAA  | TGAGGAAGTG  | 1740 |
| ATCGTCAGAA | TTATCGGGCA | CTTCTTTGCT | AGCCAGACTG | CACAGCGCAA  | GATCAGGGAA  | 1800 |

Amb  
 C2  
 wt



|            |            |            |            |            |             |      |
|------------|------------|------------|------------|------------|-------------|------|
| ATTGTACAAC | AGGTGAAGCA | GCAGGAGCAG | AAATACCCTC | AGGGAGTCGC | CTCACAGCGC  | 1860 |
| AGCAAGTGAG | GCTCCACAG  | GCACCAGCAA | AACAACGGAT | GAATGTAGCC | CTTCCAACAC  | 1920 |
| CTGACAGAAT | GAGACCAAAC | GCAGCCAGCC | AGATCGGGAG | CAAACCAAAG | ACCATCTGAG  | 1980 |
| GAATCAGAAG | TCTGCGGAGG | CGGCCAGGGA | CTCTGCCGAG | GCCCTGAGAA | CCCCAGGGGC  | 2040 |
| CGAGGAGGGG | CGGGGAAGGT | CAGCCAGGTT | TGCCAGAACC | ACCGAGCCCC | GCCTCCCGCC  | 2100 |
| CCCCAGGCT  | TCTGCAGGCT | TCAGCCATCC | ACTTCACCAT | CCACTCGGAT | CTCTCCTGAA  | 2160 |
| CTCCACGAC  | GCTATCCCTT | TTAGTTGAAC | TAACATAGGT | GAACGTGTTC | AAAGCCAAGC  | 2220 |
| AAAATGCACA | CCCTTTTTCT | GTGGCAAATC | GTCTCTGTAC | ATGTGTGTAC | ATATTAGAAA  | 2280 |
| GGGAAGATGT | TAAGATATGT | GGCCTGTGGG | TTACACAGGG | TGCCTGCAGC | GGTAATATAT  | 2340 |
| TTTAGAAATA | ATATATCAAA | TAACCAACT  | AACTCCAATT | TTTAATCAAT | TATTAATTTT  | 2400 |
| TTTTTCTTTT | TAAAGAGAAA | GCAGGCTTTT | CTAGACTTTA | AAGAATAAAG | TCTTTGGGAG  | 2460 |
| GTCTCACGGT | GTAGAGAGGA | GCTTTGAGGC | CACCCGCACA | AAATTCACCC | AGAGGGGAAAT | 2520 |
| CTCGTCGGAA | GGACACTCAC | GGCAGTTCTG | GATCACCTGT | GTATGTCAAC | AGAAGGGATA  | 2580 |
| CCGTCTCCTT | GAAGAGGAAA | CTCTGTCACT | CCTCATGCCT | GTCTAGCTCA | TACACCCATT  | 2640 |
| TCTCTTTGCT | TCACAGGTTT | TAAACTGGTT | TTTTGCATAC | TGCTATATAA | TTCTCTGTCT  | 2700 |
| CTCTCTGTTT | ATCTCTCCCT | TCCCTCCCTT | CCCCTTCTTC | TCCATCTCCA | TTCTTTTGAA  | 2760 |
| TTTCTCATC  | CCTCCATCTC | AATCCCGTAT | CTACGCACCC | CCCCCCCCC  | AGGCAAAGCA  | 2820 |
| GTGCTCTGAG | TATCACATCA | ACAAAAGGA  | ACAAAAGCGA | AACACACAAA | CCAGCCTCAA  | 2880 |
| CTTACACTTG | GTTACTCAAA | AGAACAAGAG | TCAATGGTAC | TTGTCCTAGC | GTTTTGGAAG  | 2940 |
| AGGAAAACAG | GAACCCACCA | AACCAACCAA | TCAACCAAAC | AAAGAAAAAA | TTCCACAATG  | 3000 |
| AAAGAATGTA | TTTTGTCTTT | TTGCATTTTG | GTGTATAAGC | CATCAATATT | CAGCAAAATG  | 3060 |
| ATTCCTTTCT | TTAAAAAAA  | AAATGTGGAG | GAAAGTAGAA | ATTTACCAAG | GTTGTTGGCC  | 3120 |
| CAGGGCGTTA | AATTCACAGA | TTTTTTTAA  | GAGAAAAACA | CACAGAAGAA | GCTACCTCAG  | 3180 |
| GTGTTTTTAC | CTCAGCACCT | TGCTCTTGTG | TTTCCCTTAG | AGATTTTGTA | AAGCTGATAG  | 3240 |
| TTGGAGCATT | TTTTTATTTT | TTTAATAAAA | ATGAGTTGGA | AAAAAATAA  | GATATCAACT  | 3300 |
| GCCAGCCTGG | AGAAGGTGAC | AGTCCAAGTG | TGCAACAGCT | GTTCTGAATT | GTCTTCCGCT  | 3360 |
| AGCCAAGAAC | CNATATGGCC | TTCTTTTGGA | CAAACCTTGA | AAATGTTTAT | TT          | 3412 |

<210> 7  
 <211> 1946  
 <212> DNA  
 <213> Homo sapiens  
 <220>  
 <400> 7

|            |             |            |            |            |            |      |
|------------|-------------|------------|------------|------------|------------|------|
| GCTGTAGCGG | AGGGGCTGGG  | GGGCTGCTCT | GTCCCCCTTC | TTGCGCGCTG | CGGCCTCAGC | 60   |
| CCACCCAGAG | GCCGGGGTGG  | GAGGGCGAGT | GCTCAGCTTC | CCGGGTTAGG | AGCCGGAAAA | 120  |
| TTCAAATCCG | AAATATTCCA  | CCCCAGCTCC | GATGGGAAGT | ACTGGACAGC | CTGCTGGCTC | 180  |
| AGTATGGTAC | AGTAGAGAAC  | TGTGAGCAAG | TGAACACCGA | GAGTGAGACG | GCAGTGGTGA | 240  |
| ATGTCACCTA | TTCCAACCGG  | GAGCAGACCA | GGCAAGCCAT | CATGAAGCTG | AATGGCCACC | 300  |
| AGTTGGAGAA | CCATGCCCTG  | AAGGTCTCCT | ACATCCCCGA | TGAGCAGATA | GCACAGGGAC | 360  |
| CTGAGAATGG | GCGCCGAGGG  | GGCTTTGGCT | CTCGGGGTCA | GCCCCGCCAG | GGCTCACCTG | 420  |
| TGGCAGCGGG | GGCCCCAGCC  | AAGCAGCAGC | AAGTGGACAT | CCCCCTTCGG | CTCCTGGTGC | 480  |
| CCACCCAGTA | TGTGGGTGCC  | ATTATTGGCA | AGGAGGGGGC | CACCATCCGC | AACATCACAA | 540  |
| AACAGACCCA | GTCCAAGATA  | GACGTGCATA | GGAAGGAGAA | CGCAGGTGCA | GCTGAAAAAG | 600  |
| CCATCAGTGT | GCACTCCACC  | CCTGAGGGCT | GCTCCTCCGC | TTGTAAGATG | ATCTTGGAGA | 660  |
| TTATGCATAA | AGAGGCTAAG  | GACACCAAAA | CGGCTGACGA | GTTTCCCCTG | AAGATCCTGG | 720  |
| CCCATAATAA | CTTTGTAGGG  | CGTCTCATTG | GCAAGGAAGG | ACGGAACCTG | AAGAAGGTAG | 780  |
| AGCAAGATAC | CGAGACAAAA  | ATCACCATCT | CCTCGTTGCA | AGACCTTACC | CTTTACAACC | 840  |
| CTGAGAGGAC | CATCACTGTG  | AAGGGGGCCA | TCGAGAATTG | TTGCAGGGCC | GAGCAGGAAA | 900  |
| TAATGAAGAA | AGTTCCGGGAG | GCCTATGAGA | ATGATGTGGC | TGCCATGAGC | TCTCACCTGA | 960  |
| TCCCTGGCCT | GAACCTGGCT  | GCTGTAGGTC | TTTTCCCAGC | TTTATCCAGC | GCAGTCCCGC | 1020 |
| CGCCTCCCAG | CAGCGTTACT  | GGGGCTGCTC | CCTATAGCTC | CTTTATGCAG | GCTCCCAGGC | 1080 |
| AGGAGATGGT | GCAGGTGTTT  | ATCCCCGCCC | AGGCAGTGGG | CGCCATCATC | GGCAAGAAGG | 1140 |
| GGCAGACAT  | CAAACAGCTC  | TCCCGGTTTG | CCAGCGCCTC | CATCAAGATT | GCACCACCCG | 1200 |
| AAACACCTGA | CTCCAAGTT   | CGTATGGTTA | TCATCACTGG | ACCGCCAGAG | GCCCAATTCA | 1260 |
| AGGCTCAGGG | AAGAATCTAT  | GGCAAACTCA | AGGAGGAGAA | CTTCTTTGGT | CCCAAGGAGG | 1320 |
| AAGTGAAGCT | GGAGACCCAC  | ATACGTGTGC | CAGCATCAGC | AGCTGGCCCG | GTCATTGGCA | 1380 |
| AAGGTGAAA  | AACGGTGAAC  | GAGTTGCAGA | ATTTGACGGC | AGCTGAGGTG | GTAGTACCAA | 1440 |

|            |            |            |             |            |            |      |
|------------|------------|------------|-------------|------------|------------|------|
| GAGACCAGAC | CCCTGATGAG | AACGACCAGG | TCATCGTGAA  | AATCATCGGA | CATTTCTATG | 1500 |
| CCAGTCAGAT | GGCTCAACGG | AAGATCCGAG | ACATCCCTGGC | CCAGGTTAAG | CAGCAGCATC | 1560 |
| AGAAGGACAC | GAGTAACCAG | GCCCAGGCAC | GGAGGAAAGTG | ACCAGCCCCT | CCCTGTCCCT | 1620 |
| TNGAGTCCAG | GACAACAACG | GGCAGAAATC | GAGAGTGTGC  | TCTCCCCGGC | AGGCTTGAGA | 1680 |
| ATGAGTGGGA | ATCCGGGACA | CNTGGGCCGG | GCTGTAGATC  | AGGTTTGCCC | ACTTGATTGA | 1740 |
| GAAAGATGTT | CCAGTGAGGA | ACCCTGATCT | NTCAGCCCCA  | AACACCCACC | CAATTGGCCC | 1800 |
| AACACTGTNT | GCCCCCTCGG | GTGTCAGAAA | TTNTAGCGCA  | AGGCACTTTT | AAACGTGGAT | 1860 |
| TGTTTAAAGA | AGCTCTCCAG | GCCCCACCAA | GAGGGTGGAT  | CACACCTCAG | TGGGAAGAAA | 1920 |
| AATAAAATTT | CCTTCAGGTT | TTAAAA     |             |            |            | 1946 |

<210> 8  
 <211> 3283  
 <212> DNA  
 <213> Homo sapiens  
 <220>  
 <400> 8

|            |            |            |            |            |            |      |
|------------|------------|------------|------------|------------|------------|------|
| GGCAGCGGAG | GAGGCGAGGA | GCGCGGGGTA | CCGGGCCGGG | GGAGCCGCGG | GCTCTCGGGG | 60   |
| AAGAGACGGA | TGATGAACAA | GCTTTACATC | GGGAACCTGA | GCCCCGCCGT | CACCGCCGAC | 120  |
| GACCTCCGGC | AGCTCTTTGG | GGACAGGAAG | CTGCCCTTGG | CGGGACAGGT | CCTGCTGAAG | 180  |
| TCCGGCTACG | CCTTCGTGGA | CTACCCCGAC | CAGAACTGGG | CCATCCGCGC | CATCGAGACC | 240  |
| CTCTCGGGTA | AAGTGGAAAT | GCATGGGAAA | ATCATGGAAG | TTGATTACTC | AGTCTCTAAA | 300  |
| AAGCTAAGGA | GCAGGAAAAA | TCAGATTCGA | AACATCCCTC | CTCACCTGCA | GTGGGAGGTG | 360  |
| TTGGATGGAC | TTTTGGCTCA | ATATGGGACA | GTGGAGAATG | TGGAACAAGT | CAACACAGAC | 420  |
| ACAGAAACCG | CCGTTGTCAA | CGTCACATAT | GCAACAAGAG | AAGAAGCAAA | AATAGCCATG | 480  |
| GAGAAGCTAA | GCGGGCATCA | GTTTGAGAAC | TACTCCTTCA | AGATTTCTTA | CATCCCGGAT | 540  |
| GAAGAGGTGA | GCTCCCCTTC | GCCCCCTCAG | CGAGCCGAGC | GTGGGGACCA | CTCTTCCCGG | 600  |
| GAGCAAGGCC | ACGCCCTTGG | GGGCACTTCT | CAGGCCGAGC | AGATTGATTT | CCCCTGCGG  | 660  |
| ATCCTGGTCC | CCACCCAGTT | TGTTGGTGCC | ATCATCGGAA | AGGAGGGCTT | GACCATAAAG | 720  |
| AACATCACTA | AGCAGACCCA | GTCCCGGGTA | GATATCCATA | GAAAAGAGAA | CTCTGGAGCT | 780  |
| GCAGAGAAGC | CTGTCACCAT | CCATGCCACC | CCAGAGGGGA | CTTCTGAAGC | ATGCCGCATG | 840  |
| ATTCTTGAAA | TCATGCAGAA | AGAGGCAGAT | GAGACCAAAC | TAGCCGAAGA | GATTCTCTCT | 900  |
| AAAATCTTGG | CACACAATGG | CTTGGTTGGA | AGACTGATTG | GAAAAGAAGG | CAGAAATTTG | 960  |
| AAGAAAATTG | AACATGAAAC | AGGGACCAAG | ATAACAATCT | CATCTTTGCA | GGATTTGAGC | 1020 |
| ATATACAACC | CGGAAAGAAC | CATCACTGTG | AAGGGCACAG | TTGAGGCCTG | TGCCAGTGCT | 1080 |
| GAGATAGAGA | TTATGAAGAA | GCTGCGTGAG | GCCTTTGAAA | ATGATATGCT | GGCTGTAAAC | 1140 |
| ACCCACTCCG | GATACTTCTC | CAGCCTGTAC | CCCCATCACC | AGTTTGCCCC | GTTCCCGCAT | 1200 |
| CATCACTCTT | ATCCAGAGCA | GGAGATTGTG | AATCTCTTCA | TCCCAAACCA | GGCTGTGGGC | 1260 |
| GCCATCATCG | GGAAGAAGGG | GGCACACATC | AAACAGCTGG | CGAGATTGCG | CGGAGCCTCT | 1320 |
| ATCAAGATTG | CCCCTGCGGA | AGGCCCAGAC | GTCAGCGAAA | GGATGGTCAT | CATCACCGGG | 1380 |
| CCACCGGAAG | CCCAGTTCAA | GGCCAGGGA  | CGGATCTTTG | GGAAACTGAA | AGAGGAAAAA | 1440 |
| TTCTTTAACC | CCAAAGAAGA | AGTGAAGCTG | GAGATCGATA | TCAGATGCC  | CTCTTCCACA | 1500 |
| GCTGGCCGGG | TGATTGGCAA | AGGTGGCAAG | ACCGTGAACG | AACTGCAGAA | GTTAACCAGT | 1560 |
| GCAGAAGTCA | TCGTGCCTCG | TGACCAAACG | CCAGATGAAA | ATGAGGAAGT | GATCGTCAGA | 1620 |
| ATTATCGGGC | ACTTCTTTGC | TAGCCAGACT | GCACAGCGCA | AGATCAGGGA | AATTGTACAA | 1680 |
| CAGGTGAAGC | AGCAGGAGCA | GAAATACCTT | CAGGGAGTCG | CCTCACAGCG | CAGCAAGTGA | 1740 |
| GGCTCCACAA | GGCACCAGCA | AAACAACGGA | TGAATGTAGC | CCTTCCAACA | CCTGACAGAA | 1800 |
| TGAGACCAAA | CGCAGCCAGC | CAGATCGGGA | GCAAAACCAA | GACCATCTGA | GGAATGAGAA | 1860 |
| GTCTGCGGAG | GCGGCCAGGG | ACTCTGCCGA | GGCCCTGAGA | ACCCAGGGG  | CCGAGGAGGG | 1920 |
| GCGGGGAAGG | TCAGCCAGGT | TTGCCAGAAC | CACCGAGCCC | CGCCTCCCGC | CCCCAGGGC  | 1980 |
| TTCTGCAGGC | TTCAGCCATC | ACTTCAACCA | TCCACTCGGA | TCTCTCCTGA | ACTCCACGA  | 2040 |
| CGCTATCCCT | TTTAGTTGAA | CTAACATAGG | TGAACGTGTT | CAAAGCCAAG | CAAAATGCAC | 2100 |
| ACCCTTTTTC | TGTGGCAAAT | CGTCTCTGTA | CATGTGTGTA | CATATTAGAA | AGGGAAGATG | 2160 |
| TTAAGATATG | TGGCCTGTGG | GTTACACAGG | GTGCCTGCAG | CGGTAATATA | TTTTAGAAAT | 2220 |
| AATATATCAA | ATAACTCAAC | TAACCTCAAT | TTTTAATCAA | TTATTAATTT | TTTTTTCTTT | 2280 |
| TTAAAGAGAA | AGCAGGCTTT | TCTAGACTTT | AAAGAATAAA | GTCTTTGGGA | GGTCTCACGG | 2340 |
| TGTAGAGAGG | AGCTTTGAGG | CCACCCGCAC | AAAATTACAC | CAGAGGGAAA | TCTCGTCGGA | 2400 |
| AGGACACTCA | CGGCAGTTCT | GGATCACCTG | TGTATGTCAA | CAGAAGGGAT | ACCGTCTCCT | 2460 |
| TGAAGAGGAA | ACTCTGTCAC | TCCTCATGCC | TGTCTAGCTC | ATACACCCAT | TTCTCTTTGC | 2520 |

2b  
 C2  
 w/

TTCACAGGTT TTAAACTGGT TTTTTCGATA CTGCTATATA ATTCTCTGTC TCTCTCTGTT 2580  
 TATCTCTCCC CTCCCTSCCC TCCCCTTCTT CTCCATCTCC ATTCTTTTGA ATTTCCCTCAT 2640  
 CCCTCCATCT CAATCCCGTA TCTACGCACC CCCCCCCCCC CAGGCAAAGC AGTGCTCTGA 2700  
 GTATCACATC ACACAAAAGG AACAAAAGCG AAACACACAA ACCAGCCTCA ACTTACACTT 2760  
 GGTTACTCAA AAGAACAAGA GTCAATGGTA CTTGTCCTAG CGTTTTGGAA GAGGAAAACA 2820  
 GGAACCCACC AAACCAACCA ATCAACCAAA CAAAGAAAAA ATTCCACAAT GAAAGAATGT 2880  
 ATTTTGTCTT TTTGCATTTT GGTGTATAAG CCATCAATAT TCAGCAAAAT GATTCCTTTC 2940  
 TTTAAAAAAA AAAATGTGGA GGAAAGTAGA AATTTACCAA GGTGTGTTGC CCAGGGCGTT 3000  
 AAATTCACAG ATTTTTTTTAA CGAGAAAAAC ACACAGAAGA AGCTACCTCA GGTGTTTTTA 3060  
 CCTCAGCACC TTGCTCTTGT GTTTCCTTA GAGATTTTGT AAAGCTGATA GTTGGAGCAT 3120  
 TTTTTTATTT TTTTAATAAA AATGAGTTGG AAAAAAATA AGATATCAAC TGCCAGCCTG 3180  
 GAGAAGGTGA CAGTCCAAGT GTGCAACAGC TGTCTGAAT TGTCTTCCGC TAGCCAAGAA 3240  
 CCNATATGGC CTTCTTTTGG ACAAACCTTG AAAATGTTTA TTT 3283

B' concio  
 De  
 C<sup>2</sup>